DETAILED ACTION

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "44" has been used to designate both a software portion and the outer tube. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claims 2-8 are objected to because of the following informalities:

The dependent claims must begin with --The-- to properly recite their dependence on the independent claim and the system that has been recited. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

> invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 7, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirakawa et al. (US 2003/0122543) hereafter Shirakawa in view of Adams (US 5150812).

In regard to claims 1, 7-8, Shirakawa teaches a helium-3 refrigerator (20) utilizing a magnetic property measurement system (1) comprising: a helium-3 refrigerator (20) provided with a sample rod (5) having a sample (parag. 12) fixed thereon and a main pipe (17, 18, 23, 29) having the sample rod (5) inserted therein and forming in a circumference of the sample rod (5) a space for effecting cooling with helium-3 (parag. 12) and a magnetic property measurement system (1) provided with a tubular body (8) for permitting insertion of the helium-3 refrigerator (20) therein and a cooling means (2, 6) disposed on an outer periphery of the tubular body (8) and operated with helium-4 (parag. 32) and further provided with a superconducting magnet (3a, parag. 31, 37), a magnetic field forming means (parag. 53, 54), a temperature adjusting means (54) and a magnetic field adjusting means (52); the main pipe is formed sequentially from top to bottom, of an upper supporting tube (, 17, 18), a condensing tube (23 or 23 to top of

29), a lower inner tube (inner of 29) and an outer tube (outer of 29) adapted to form an insulated vacuum chamber (in 29 - parag. 35) between the outer tube (outer of 29) and the lower inner tube (inner of 29). Shirakawa does not explicitly teach that the lower inner tube is formed of titanium. However, it is well known to employ titanium as a material for cryogenic housings as taught by Adams (column 1, line 67, column 5, lines 1-5 - teaching that the inner walls of cryogenic vessels formed of titanium). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to form the inner wall of the vacuum vessel (29) of Shirakawa from titanium for the purpose of employing a well known, light, strong material.

In regard to claim 7, Shirakawa teaches that the outer tube (of 29) and the lower inner tube (of 29) are connected to each other via a lower part of the condensing tube (23) with a certain gap (space between walls of 29).

In regard to claim 8, Shirakawa teaches a connecting tube (23 below top of 29 and horizontal extension between inner and outer tubes) is mounted on an underside of the condensing tube (23 to top of 29) and the outer tube (outer of 29) and the lower inner tube (inner 29) are connected to each other via the connecting tube (23 below top of 29 and horizontal connection, as without this tube portion the inner and outer walls would not be connected) with a certain gap (between inner and outer of 29).

Claims 1, 7, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirakawa in view of Bard (US 5119637).

In regard to claims 1, 7-8, Shirakawa teaches a helium-3 refrigerator (20) utilizing a magnetic property measurement system (1) comprising: a helium-3 refrigerator (20) provided with a sample rod (5) having a sample (parag. 12) fixed thereon and a main pipe (17, 18, 23, 29) having the sample rod (5) inserted therein and forming in a circumference of the sample rod (5) a space for effecting cooling with helium-3 (parag. 12) and a magnetic property measurement system (1) provided with a tubular body (8) for permitting insertion of the helium-3 refrigerator (20) therein and a cooling means (2, 6) disposed on an outer periphery of the tubular body (8) and operated with helium-4 (parag. 32) and further provided with a superconducting magnet (3a, parag. 31, 37), a magnetic field forming means (parag. 53, 54), a temperature adjusting means (54) and a magnetic field adjusting means (52); the main pipe is formed sequentially from top to bottom, of an upper supporting tube (, 17, 18), a condensing tube (23 or 23 to top of 29), a lower inner tube (inner of 29) and an outer tube (outer of 29) adapted to form an insulated vacuum chamber (in 29 - parag. 35) between the outer tube (outer of 29) and the lower inner tube (inner of 29). Shirakawa does not explicitly teach that the lower inner tube is formed of titanium. However, it is well known to employ titanium as a material for cryogenic housings as taught by Bard (column 3, line 64-65, teaching that the cryogenic vessel is formed of titanium). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to form the inner wall of the vacuum vessel (29) of Shirakawa from titanium for the purpose of employing a well known, light, strong material.

In regard to claim 7, Shirakawa teaches that the outer tube (of 29) and the lower inner tube (of 29) are connected to each other via a lower part of the condensing tube (23) with a certain gap (space between walls of 29).

In regard to claim 8, Shirakawa teaches a connecting tube (23 below top of 29 and horizontal extension between inner and outer tubes) is mounted on an underside of the condensing tube (23 to top of 29) and the outer tube (outer of 29) and the lower inner tube (inner 29) are connected to each other via the connecting tube (23 below top of 29 and horizontal connection, as without this tube portion the inner and outer walls would not be connected) with a certain gap (between inner and outer of 29).

Claims 2-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirakawa in view of Adams and further in view of Zeamer (US 4613816) and Davidson (US 2900237). Shirakawa, as modified, teaches most of the claim limitations but does not teach that the condensing tube (23 or 23 to top of 29) and the outer tube (outer of 29) comprise copper. However, it is well known for measurement probes to comprise copper for the purpose of maintaining a uniform temperature as taught by Zeamer (column 1, line 64-65). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, for the condensing tube (23 or 23 to top of 29) and the outer tube (29) to comprise copper. In addition, Shirakawa, as modified does not explicitly teach that the upper supporting tube (17, 18, 23, 29) comprised stainless steel. However, stainless steel is a common material for cryogenic components and especially sealing components as taught by Davidson (column 12,

lines 30-32). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to provide stainless steel for the upper supporting tube (17, 18, 23, 29) for the purpose of providing a strong material that would be durable and long lasting as a vacuum fitting material.

Claims 2-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirakawa in view of Bard and further in view of Zeamer and Davidson. Shirakawa, as modified, teaches most of the claim limitations but does not teach that the condensing tube (23 or 23 to top of 29) and the outer tube (outer of 29) comprise copper. However, it is well known for measurement probes to comprise copper for the purpose of maintaining a uniform temperature as taught by Zeamer (column 1, line 64-65). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, for the condensing tube (23 or 23 to top of 29) and the outer tube (29) to comprise copper. In addition, Shirakawa, as modified does not explicitly teach that the upper supporting tube (17, 18, 23, 29) comprised stainless steel. However, stainless steel is a common material for cryogenic components and especially sealing components as taught by Davidson (column 12, lines 30-32). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to provide stainless steel for the upper supporting tube (17, 18, 23, 29) for the purpose of providing a strong material that would be durable and long lasting as a vacuum fitting material.

Response to Arguments

Applicant's arguments filed 12/03/2010 have been fully considered and are moot in view of the rejection above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John F. Pettitt whose telephone number is 571-272-0771. The examiner can normally be reached on M-F 8a-4p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John F Pettitt /
Examiner, Art Unit 3744

JFP III
January 26, 2012